Effect of epigallocatechin gallate on nicotine-treated *Fusobacterium nucleatum* biofilm

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Abstract

Tea polyphenols such as epigallocatechin gallate (EGCG) have exhibited antimicrobial properties. *Fusobacterium nucleatum* is an oral bacterium that is associated with periodontal diseases. Biofilm adheres to the enamel surfaces of our teeth as plaque. Biofilm formation in the oral cavity leads to many complications such as caries and periodontal diseases. Those who smoke tend to have increased risk of periodontal diseases and *F. nucleatum* biofilm formation. The objective of this research was to determine the effects of EGCG (0.25 mg/ml) and varying concentrations of nicotine (0-32 mg/ml) on *F. nucleatum* biofilm. The study was conducted by treating *F. nucleatum* biofilm with various concentrations of nicotine (0-32 mg/ml) and EGCG. Biofilm formation was measured using a crystal violet dye staining assay and a spectrophotometer. Biofilm formation of *F. nucleatum* with EGCG and nicotine exhibited a significant decrease in biofilm formation at low concentrations of nicotine (0-4 mg/ml). EGCG alone without nicotine significantly reduces *F. nucleatum* biofilm formation. EGCG can be added to dental treatments such as toothpaste and mouthwash for those who smoke. Periodontal diseases lead to many health problems in other parts of the body, therefore it is important to find ways to decrease biofilm formation of *F. nucleatum*.

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